

SITE

Name: Budleigh Salterton Cliffs

Parish: Budleigh

Local Authority: East Devon

National Grid Ref: SY 060 815

OS Sheets: 1:50K, 192, 1:10K, SY08 SE

Locality Description: East Devon coast at Budleigh Salterton, approximately 6km to east of Exmouth

Nature and Status of Site: Coastal cliff exposure. It forms part of a [Site of Special Scientific Interest](#) (SSSI) and the [Jurassic Coast World Heritage Site](#). Note that due to the enforcement of Coast Protection legislation, the collection of pebbles from the beach is no longer permitted.

Summary of Geological / Geomorphological Interest: This coastal section exposes the full thickness of the Lower Triassic Budleigh Salterton Pebble Beds. A sequence of texturally mature conglomerates deposited in braided rivers, including Ordovician quartzite derived from the erosion of a ridge of much older Palaeozoic rocks lying to the south/south-west. Fluvial (water-deposited) and aeolian (wind-blown) sandstones of the Otter Sandstone Formation overlie the conglomerates, which display a layer of wind-faceted pebbles with a desert varnish (a coating of iron and manganese oxides). Calcrete pipes formed around roots are exposed in the sandstone. Information about the beach at Budleigh Salterton can be found on the [Jurassic Coast](#) website.

Safety Considerations: Hard hats to be worn if approaching cliff faces (after preliminary visual assessment of any potential risk).

Educational Age Groups: Primary, Secondary, College/6th Form, University.

Parking and Access: The main site is extremely well exposed and accessible. Access on foot is possible via the [South West Coast Path](#) or along the beach from Budleigh Salterton. Additionally, there is an Exmouth to Budleigh Salterton cycle route which can be used. Public transport also provides an option with buses operating regularly from Exmouth and Sidmouth and train services running to Exmouth. For timetable details, visit www.traveline.org.uk. If you plan to travel by car, there are ample parking facilities at Budleigh Salterton.

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Online References:

The Jurassic Coast, Dorset and East Devon World Heritage Site, (online) at www.jurassiccoast.com

Detailed Geology: The cliffs between West Down and Budleigh Salterton expose the full succession of the Budleigh Salterton Pebble Beds. Cobbles, boulders and pebbles comprise 80% of the formation and are set in gravel and silty sand, with an irregular upward decrease in the size of the larger clasts. Metaquartzite cobbles and boulders (up to 45cm in diameter) are the dominant clasts. Cobbles and pebbles of schorl, vein quartz, porphyries and sandstones are also present. Some of the porphyry clasts have been strongly tourmalinised. The porphyries from the Budleigh Salterton Pebble Beds and the Midland Pebble Beds were probably derived from the same petrographic province, possibly the quartz-porphyries of Cawsand Bay or the rhyolites of the Kingsbridge district. The presence of tourmalinised porphyries suggests derivation from aureole rocks near one of the local granites. The sands are rarely cemented and poorly sorted. Blocks of mudstone are locally present above scoured surfaces and provide evidence of penecontemporaneous erosion. Large-scale cross-bedding is common in the sandstone beds and fill large, flute-shaped scours several meters deep and long, and each comprises a fining-upwards unit of cobbles, pebbles and sand, characteristic of channel infilling by braided rivers. A northerly direction of flow is shown by pebble imbrication. The top of the formation shows an interesting desert platform where the topmost pebbles of the river deposits were evidently subjected to aeolian abrasion before being covered by the basal aeolian sands of the Otter Sandstone Formation. The wind-faceted pebbles in this bed, where still present, show a desert varnish, being a coating of iron and

manganese oxides. Calcrete pipes and concretions within the sandstone at the eastern end of the site were formed around roots.

Additional features of interest include accessible exposures of Otter Sandstone Formation at Otterton Point, E of Budleigh Salterton, and a well preserved natural estuary system with saltmarshes at the mouth of the River Otter,.

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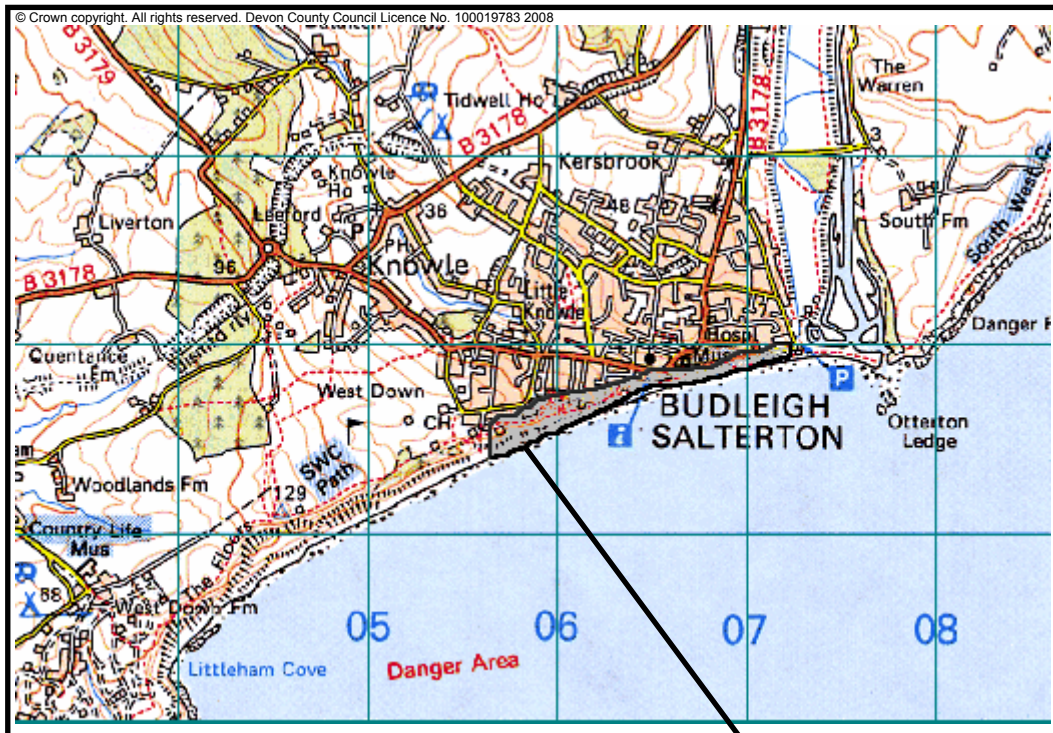
Suggested Questions

1. What can the cross-bedding and imbrication of the pebbles tell us about sediment movement?
2. What features are present to distinguish aeolian deposition from fluvial?
3. What factors cause the cliffs at West Down to remain high, whilst the eastern cliffs are declining?

LOCATION PLAN

BUDLEIGH SALTERTON CLIFFS, SSSI BUDLEIGH, EAST DEVON

National Grid Ref: SY 060 815



Scale 1: 40,000



Site Locality

Coastal cliff exposures

Parking and Access

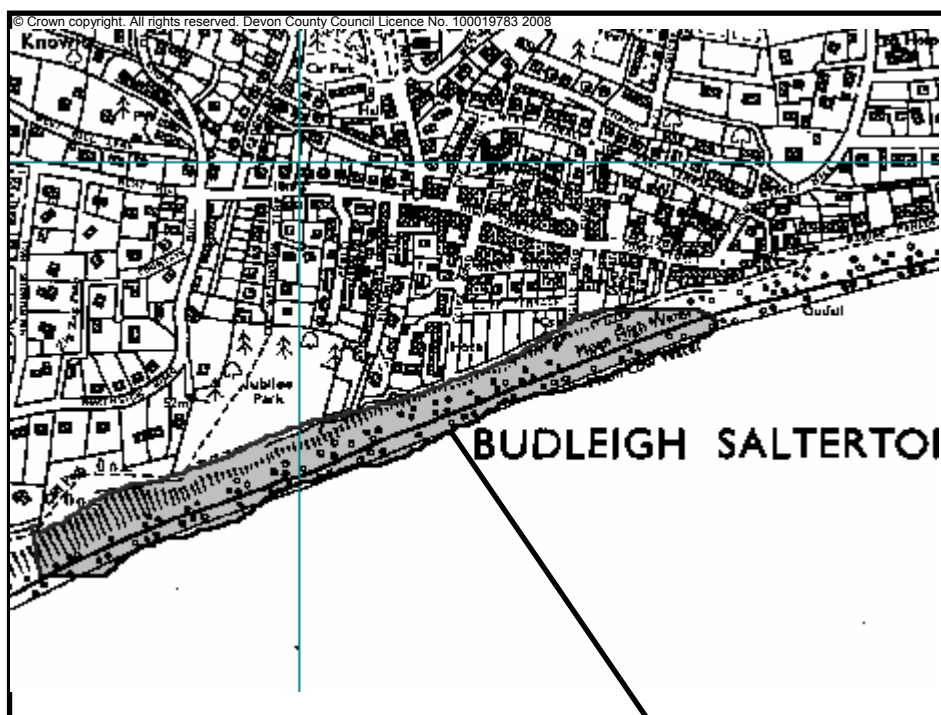
- Good public transport links via buses to Exmouth and Sidmouth and trains to Exmouth.
- Direct access to the site from here by coastal footpath or along beach.
- Public car parks in Budleigh Salterton, especially beside mouth of Otter Estuary.

Well preserved natural estuary system with saltmarshes at the mouth of the River Otter, E of Budleigh Salterton.

SITE PLAN

BUDLEIGH SALTERTON CLIFFS BUDLEIGH SALTERTON, EAST DEVON

National Grid Ref: SY 060 815



Scale 1: 10,000


Key Focal Point

View west from the
promenade

Main Points of Interest:

- Magnificent coastal section exposing the full thickness of the Lower Triassic Budleigh Salterton Pebble Beds.
- These include pebbles of Ordovician quartzite, derived from the erosion of a ridge of much older Palaeozoic rocks lying to the south-west.
- The conglomerates are overlain by fluvial and aeolian sandstones of the Otter Sandstone Formation.
- Low Cliff (behind promenade) exposes Otter Sandstone with prominent vertical calcrete 'pipes'
- Well preserved natural estuary system with saltmarshes at the mouth of the River Otter, E of Budleigh Salterton.

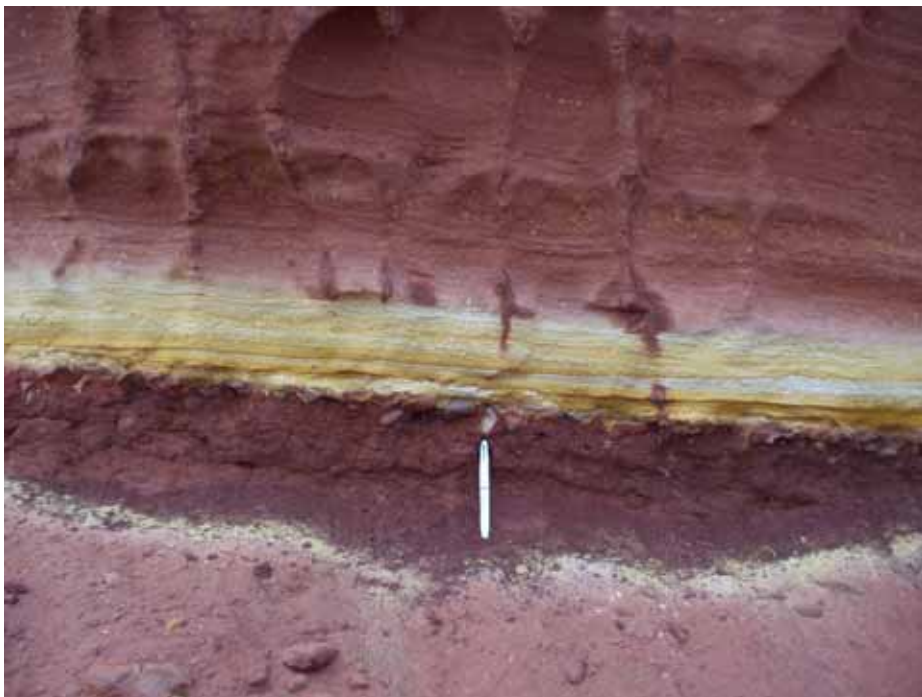
BUDLEIGH SALTERTON CLIFFS

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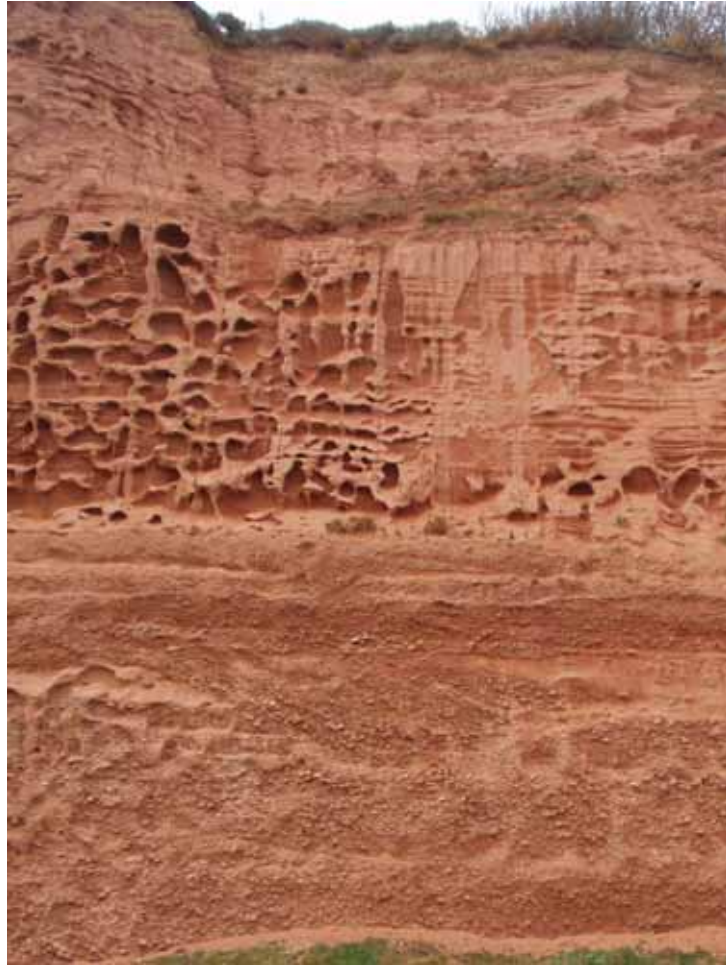


Cliffs immediately west of Budleigh Salterton promenade, showing the wind-abrasion surface at the top of the Budleigh Salterton Pebble Beds (immediately below the pale band in the cliff). The upper part of the cliffs is formed of Otter Sandstone Formation.

© Clyde Bish



Detail of the boundary between the Budleigh Salterton Pebble Beds and the Otter Sandstone Formation showing the wind-abrasion surface.



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Budleigh Salterton Pebble Beds - Otter Sandstone Formation boundary in cliff West of Budleigh Salterton – note cross bedding in former.



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Pebbles of Ordovician, etc, quartzite eroded from the Triassic Budleigh Salterton Pebble Beds and now forming the modern beach.

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Otter Sandstone Formation exposed in Otterton Point, East of Budleigh Salterton.

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Well preserved natural estuary system with saltmarshes at the mouth of the River Otter, East of Budleigh Salterton.